SEQUENCE LISTING

<110> Cahoon, Rebecca E.
      Caimi, Perry G.
      Klein, Theodore M.
      Morgante, Michelle
      Sakai, Hajime
      Shen, Jennie Bih-Jien
      Tingey, Scott V.

<120> INHIBITORS OF APOPTOSIS PROTEINS IN PLANTS

<130> BB-1148

<140> US 09/601,929
<141> 2000-08-09

<150> US 60/078,144
<151> 1998-03-16

<150> PCT/US99/05227
<151> 1999-03-10

<160> 16

<170> MICROSOFT WORD VERSION 7.0A

<210> 1
<211> 499
<212> DNA
<213> Phaseolus lunatus

<400> 1

```
gcgaagatct gagagaatgg cgaggtctag cagcaaggat gcacaagacc ttttccgagc  60
tctttggtct gcttatgccg caacccccac aaatctcaag atcattgacc tctacgtcat 120
gttcgctgtt ttcaccgctc tcatccaggt agtttacatg gctttggtgg gatcatttcc 180
ttttaactcc ttcctatcag gagtactttc ttgtgtcgga actgctgttc ttgctgtttg 240
tctcaggatc caagtgaata aagagaataa ggaattcaag gatcttgcac ctgagcgagc 300
ttttgcagat tttgttctct gtaatctggt gcttcatttg gtgatcatga acttccttgg 360
ttaatttgag ttcatgtggc tgttgttggt tttgatcaaa ccttggataa taaaaagtaa 420
tagtagtata cctagacttt tgtaatagta tttatagaca gtaacttcca actaactgct 480
ttagtatttt gttgattcc                                              499
```

<210> 2
<211> 115
<212> PRT
<213> Phaseolus lunatus

<400> 2

```
Met Ala Arg Ser Ser Ser Lys Asp Ala Gln Asp Leu Phe Arg Ala Leu
1               5                   10                  15

Trp Ser Ala Tyr Ala Ala Thr Pro Thr Asn Leu Lys Ile Ile Asp Leu
            20                  25                  30

Tyr Val Met Phe Ala Val Phe Thr Ala Leu Ile Gln Val Val Tyr Met
        35                  40                  45

Ala Leu Val Gly Ser Phe Pro Phe Asn Ser Phe Leu Ser Gly Val Leu
    50                  55                  60
```

```
Ser Cys Val Gly Thr Ala Val Leu Ala Val Cys Leu Arg Ile Gln Val
65                  70                  75                  80

Asn Lys Glu Asn Lys Glu Phe Lys Asp Leu Ala Pro Glu Arg Ala Phe
                85                  90                  95

Ala Asp Phe Val Leu Cys Asn Leu Val Leu His Leu Val Ile Met Asn
            100                 105                 110

Phe Leu Gly
        115

<210> 3
<211> 712
<212> DNA
<213> Zea mays

<400> 3
gcacgagggc cgctgcccga ccccgacgcc tgctgcccag gtcttcgccg gcgacgagca  60
ctccaccaga cgagagggga ttccaagatg ccgagggcca ccagcgacgc gaagctcctg 120
atccagtccc tcggcaaggc gtacgctgcc acaccaacaa atctcaagat tattgacctc 180
tacgtgggtt ttgcggttgc cactgccctt attcaggttg cttacatggg attggttggg 240
tcgtttccct tcaactcctt cctctcagga gtcctttcat gcataggaac tgcagttctt 300
gctgtttgcc tccgcattca agtgaacaaa gacaacaaag aattcaagga ccttccccca 360
gaaagggcct ttgctgattt cgtcctatgc aatctggtgc tccacctggt gatcatgaat 420
ttcctcggat aagcaactgc tgcaccatgt tggttaaagg ttttgtagcc ccaggttgtg 480
gtcgctgatt gttgccttta aatgtttgga actgttgtga tcgtgatgtc gaatatccat 540
atgatctgtt gaaggattac ttgtgtaagc tgagtattcc cggagggaac tattagtcga 600
atggacagtt tgcccagcgc tgagaatgtg acctagcatg ttctttattt gaagaagata 660
taattcattt ttcaaaaaaa aaaaaaaaaa aactcgaggg gggcccgtac cc         712

<210> 4
<211> 114
<212> PRT
<213> Zea mays

<400> 4
Met Pro Arg Ala Thr Ser Asp Ala Lys Leu Leu Ile Gln Ser Leu Gly
1               5                   10                  15

Lys Ala Tyr Ala Ala Thr Pro Thr Asn Leu Lys Ile Ile Asp Leu Tyr
            20                  25                  30

Val Gly Phe Ala Val Ala Thr Ala Leu Ile Gln Val Ala Tyr Met Gly
        35                  40                  45

Leu Val Gly Ser Phe Pro Phe Asn Ser Phe Leu Ser Gly Val Leu Ser
    50                  55                  60

Cys Ile Gly Thr Ala Val Leu Ala Val Cys Leu Arg Ile Gln Val Asn
65                  70                  75                  80

Lys Asp Asn Lys Glu Phe Lys Asp Leu Pro Pro Glu Arg Ala Phe Ala
                85                  90                  95

Asp Phe Val Leu Cys Asn Leu Val Leu His Leu Val Ile Met Asn Phe
            100                 105                 110

Leu Gly
```

<210> 5
<211> 917
<212> DNA
<213> Glycine max

<220>
<221> unsure
<222> (631)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (636)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (652)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (657)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (719)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (785)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (843)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (849)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (859)..(860)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (886)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (890)

```
<223> n is a, c, g or t

<220>
<221> unsure
<222> (897)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (906)
<223> n is a, c, g or t

<400> 5
ggcaaatcgc gaagactaga tctgatctga gagaatggct cctcggtcta gcagcaagga  60
cgcccaagac cttttccgcg ctctttggtc tgcttatgct gcaaccccca ctaatctcaa 120
gatcattgat ctctatgtca tctatgccgt attcaccgct ttcatccagg ttgtttacat 180
ggctttggtt ggatcatttc catttaactc cttcctatca ggagtacttt cttgtgtagg 240
aactgctgtt cttgctgttt gtctcaggat ccaagtgaat aaagagaata aggaattcaa 300
ggatcttgca cctgagcgcg cttttgcgga ttttgttctc tgtaatttgg tgcttcattt 360
ggtgatcatg aacttccttg gttaaattgg gtttgtgtgg cggttgttgt ttctgattga 420
acccttcgat aataaaaatt aaatagtagt atacctagac ttttgtaata gtatttatag 480
acagtagccg gcattctact aattgcttta gctttatgtt gattaccccc acctcccatt 540
tttgggttcc ctgttttgaa cgaagagatt ttgccatctt ttgaagttta aagtactttt 600
gaatggcgaa ataaagaagg attgttatta naaaanaaaa aaaaataaca anatatnaac 660
gcttacattt aagtggcact ttcggggaaa tgtgcgcgga accctattgt taatttccna 720
aatacatcaa atagtaccgc caagaacata accctgataa agctcataat atgaaaagga 780
gatanatatc acattcgtgt cgcctaaccc ttttgcggat ttgcctcccg gttttgccaa 840
canaacccng gaaataaann gcgaaatact ggtgccaatg gtaacnatgn ttcaaangga 900
aatctnaaat tcccaag                                                917

<210> 6
<211> 116
<212> PRT
<213> Glycine max

<400> 6
Met Ala Pro Arg Ser Ser Ser Lys Asp Ala Gln Asp Leu Phe Arg Ala
1               5                   10                  15

Leu Trp Ser Ala Tyr Ala Ala Thr Pro Thr Asn Leu Lys Ile Ile Asp
            20                  25                  30

Leu Tyr Val Ile Tyr Ala Val Phe Thr Ala Phe Ile Gln Val Val Tyr
        35                  40                  45

Met Ala Leu Val Gly Ser Phe Pro Phe Asn Ser Phe Leu Ser Gly Val
    50                  55                  60

Leu Ser Cys Val Gly Thr Ala Val Leu Ala Val Cys Leu Arg Ile Gln
65                  70                  75                  80

Val Asn Lys Glu Asn Lys Glu Phe Lys Asp Leu Ala Pro Glu Arg Ala
                85                  90                  95

Phe Ala Asp Phe Val Leu Cys Asn Leu Val Leu His Leu Val Ile Met
            100                 105                 110

Asn Phe Leu Gly
        115
```

```
<210> 7
<211> 2671
<212> DNA
<213> Zea mays

<220>
<221> unsure
<222> (690)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (2161)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (2180)
<223> n is a, c, g or t

<400> 7
gcatcccttc ccagttctgt ccctctcgaa ccctaactcc aaaaaccctc gctctcctct   60
catggccgcc gccgcagctg acgacgcagc cgaggtggag cggctttacg agctcggcga  120
gcgcctctcc tccgccaatg acaagtccga gcatgcggcg gactacgagg cgattattgc  180
agcggtgaag ggacagagtg ccaaggcgaa gcagctcgca gcgcagctta tccccaggtt  240
cttccggagc ttccctgcac tcggcacgcg cgccatgtca gccatgttcg atctcgtcga  300
tatggaggag ctcgcgatca gaatacaagc tattcgtggc tttccacttc ttggcaaaga  360
tactgaattt gtgtcaaaaa ttgcagatgt tttgggtcag ctccttacaa gcgaggaaaa  420
tgttgagcgt gatgctgttc ataaagcgct catgtccctt atacggcaag atgttaaaaa  480
ttcattacaa cctttattta agcatgtgga gcaaggatca gagattcgtg agaagattat  540
ttgttttctt cgagacaagg tctttcctct taaagcagag ctgctgaaac ctcaagcaga  600
aatggagaga tttataacgg atttgataaa gaaaagtgtg caagatgtaa ctggttcaga  660
attcgaacta ttcatggggt tcttgcgaan ttggagcata tttggggatt ctgctcctag  720
agagtccttt caagaactaa ttgaaattat tcaagcacag gctgatctga attcacaatt  780
caacgtttct gacattgacc acattgagag gtggatttca tgcatgtata tggctcttcc  840
gatcttcatg agaggagcat cagcaagcaa gttcctcaat tacttcgtta agcaaattgt  900
tccagcattc gagaagattc ctgaagaaaa gaaactggat ttgctcaaga ctattgcttc  960
aagttcaccg tacgcgacag ctcaagattc acgtcagctg cttccatctg ttgttcagtt 1020
actcaacaaa tatatgcctg ggaagaaggt ggacgatatc aaccataatt atgttgaatg 1080
cttgctgtac acttatcatc atttggctca taagactcca aacacaacga acagtctatg 1140
tggttacaag attgttactg ggcaaccatc ggatagactt ggagaggact tcacagagca 1200
ttacaaagat tttacagaga ggttaactgg aacagaagag acggtaagag cagcctcaaa 1260
gcgactaact cagggaatgg cagatttcag caaggcaata tcttcagcaa aaaccgaaga 1320
ggaaaaaact aaaattaaag gcgatcaaca aacttcaaca aggacaatga ggtcatataa 1380
caatatattg gcaatgacac agtcattgca ttcaaaatcc cctttattta tcggtgataa 1440
gaaaatcact ctgtcatgga tggagcagcc caacaaagca gcagctacga aagcaggggg 1500
gaagaggtca caacctagta caaatgggaa tgaccctgca aacaagaagg ggagaggagg 1560
aatgcaaaac cagctagtga acagagcttt tgaaggactg tctcatgttg gaagaggcag 1620
tggaagaggt cggggcaagg gtgggccgag gaagaggaag aggatggagt ggggtaccac 1680
tgagatgacc tggaaattat gttcaaacct gacaagggat gagctttctg cttccaccag 1740
agagtaaact ccaaggtcga tgttttattg gtgtgcatta ctgcaacgcg ttgaaatgga 1800
tcaaggcaca caacagcaga aatgcgtaca cagagaaagg atgctaagaa atatctgcaa 1860
gtttgtgcat ctttcttatc catttaccat ctcatcgtgt tctttgccac cctaaccgtc 1920
gtgtcacctg cgttggctgg ctgtttgatg aactgggcag ttcgatatct ttgttcttta 1980
ttttatttta cagtgtttga agagacgacc aagcttgtgc tgactttgtt tgagttcgtt 2040
ttatgtttcg tccttgtact gacacagatg tattagtgat gtttaacttt tatgtaacga 2100
ttgattagct gtaatataag ttaagcattt aataagctat ttaaaaaaaa aaaaaaaacc 2160
nkrcgggatt ggagttgggn cccactgagg atgaccttgg aaatttattg ttcaaaacct 2220
tgaccaaggg gatgagcttt ctgcttccac cagagagtaa actccaaggt cgatgtttta 2280
ttggtgtgca ttactgcaac gcgttgaaat ggatcaaggc acacaacagc agaaatgcgt 2340
```

```
acacagagaa aggatgctaa gaaatatctg caagtttgtg catctttctt atccatttac 2400
catctcatcg tgttctttgc caccctaacc gtcgtgtcac ctgcgttggc tggctgtttg 2460
atgaactggg cagttcgata tctttgttct ttattttatt ttacagtgtt tgaagagacg 2520
accaagcttg tgctgacttt gtttgagttc gttttatgtt tcgtccttgt actgacacag 2580
atgtattagt gatgtttaac ttttatgtaa cgattgatta gctgtaatat aagttaagca 2640
tttaataagc tatttaaaaa aaaaaaaaaa a                                 2671
```

<210> 8
<211> 561
<212> PRT
<213> Zea mays

<220>
<221> UNSURE
<222> (210)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> UNSURE
<222> (523)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> UNSURE
<222> (526)
<223> Xaa can be any naturally occurring amino acid

<400> 8

```
Met Ala Ala Ala Ala Ala Asp Asp Ala Ala Glu Val Glu Arg Leu Tyr
1               5                   10                  15

Glu Leu Gly Glu Arg Leu Ser Ser Ala Asn Asp Lys Ser Glu His Ala
            20                  25                  30

Ala Asp Tyr Glu Ala Ile Ile Ala Ala Val Lys Gly Gln Ser Ala Lys
        35                  40                  45

Ala Lys Gln Leu Ala Ala Gln Leu Ile Pro Arg Phe Phe Arg Ser Phe
    50                  55                  60

Pro Ala Leu Gly Thr Arg Ala Met Ser Ala Met Phe Asp Leu Val Asp
65                  70                  75                  80

Met Glu Glu Leu Ala Ile Arg Ile Gln Ala Ile Arg Gly Phe Pro Leu
                85                  90                  95

Leu Gly Lys Asp Thr Glu Phe Val Ser Lys Ile Ala Asp Val Leu Gly
            100                 105                 110

Gln Leu Leu Thr Ser Glu Glu Asn Val Glu Arg Asp Ala Val His Lys
        115                 120                 125

Ala Leu Met Ser Leu Ile Arg Gln Asp Val Lys Asn Ser Leu Gln Pro
    130                 135                 140

Leu Phe Lys His Val Glu Gln Gly Ser Glu Ile Arg Glu Lys Ile Ile
145                 150                 155                 160

Cys Phe Leu Arg Asp Lys Val Phe Pro Leu Lys Ala Glu Leu Leu Lys
                165                 170                 175
```

```
Pro Gln Ala Glu Met Glu Arg Phe Ile Thr Asp Leu Ile Lys Lys Ser
            180                 185                 190

Val Gln Asp Val Thr Gly Ser Glu Phe Glu Leu Phe Met Gly Phe Leu
        195                 200                 205

Arg Xaa Trp Ser Ile Phe Gly Asp Ser Ala Pro Arg Glu Ser Phe Gln
    210                 215                 220

Glu Leu Ile Glu Ile Ile Gln Ala Gln Ala Asp Leu Asn Ser Gln Phe
225                 230                 235                 240

Asn Val Ser Asp Ile Asp His Ile Glu Arg Trp Ile Ser Cys Met Tyr
                245                 250                 255

Met Ala Leu Pro Ile Phe Met Arg Gly Ala Ser Ala Ser Lys Phe Leu
            260                 265                 270

Asn Tyr Phe Val Lys Gln Ile Val Pro Ala Phe Glu Lys Ile Pro Glu
        275                 280                 285

Glu Lys Lys Leu Asp Leu Leu Lys Thr Ile Ala Ser Ser Ser Pro Tyr
    290                 295                 300

Ala Thr Ala Gln Asp Ser Arg Gln Leu Leu Pro Ser Val Val Gln Leu
305                 310                 315                 320

Leu Asn Lys Tyr Met Pro Gly Lys Lys Val Asp Asp Ile Asn His Asn
                325                 330                 335

Tyr Val Glu Cys Leu Leu Tyr Thr Tyr His His Leu Ala His Lys Thr
            340                 345                 350

Pro Asn Thr Thr Asn Ser Leu Cys Gly Tyr Lys Ile Val Thr Gly Gln
        355                 360                 365

Pro Ser Asp Arg Leu Gly Glu Asp Phe Thr Glu His Tyr Lys Asp Phe
    370                 375                 380

Thr Glu Arg Leu Thr Gly Thr Glu Glu Thr Val Arg Ala Ala Ser Lys
385                 390                 395                 400

Arg Leu Thr Gln Gly Met Ala Asp Phe Ser Lys Ala Ile Ser Ser Ala
                405                 410                 415

Lys Thr Glu Glu Glu Lys Thr Lys Ile Lys Gly Asp Gln Gln Thr Ser
            420                 425                 430

Thr Arg Thr Met Arg Ser Tyr Asn Asn Ile Leu Ala Met Thr Gln Ser
        435                 440                 445

Leu His Ser Lys Ser Pro Leu Phe Ile Gly Asp Lys Lys Ile Thr Leu
    450                 455                 460

Ser Trp Met Glu Gln Pro Asn Lys Ala Ala Ala Thr Lys Ala Gly Gly
465                 470                 475                 480

Lys Arg Ser Gln Pro Ser Thr Asn Gly Asn Asp Pro Ala Asn Lys Lys
                485                 490                 495
```

```
Gly Arg Gly Gly Met Gln Asn Gln Leu Val Asn Arg Ala Phe Glu Gly
            500                 505                 510

Leu Ser His Val Gly Arg Gly Ser Gly Arg Xaa Arg Gly Xaa Gly Gly
        515                 520                 525

Pro Arg Lys Arg Lys Arg Met Glu Trp Gly Thr Thr Glu Met Thr Trp
    530                 535                 540

Lys Leu Cys Ser Asn Leu Thr Arg Asp Glu Leu Ser Ala Ser Thr Arg
545                 550                 555                 560

Glu


<210> 9
<211> 556
<212> DNA
<213> Oryza sativa

<220>
<221> unsure
<222> (179)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (339)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (345)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (368)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (390)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (392)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (427)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (434)
```

```
<223> n is a, c, g or t

<220>
<221> unsure
<222> (464)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (472)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (496)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (518)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (524)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (534)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (551)
<223> n is a, c, g or t

<400> 9
ggcatactaa cccccccaaa tctcccacac cgctcccccg ccgccatggc cgcctccgac  60
gccgacgccg cggaggtcga gcggctctac gagctcggcg agcgcctctc ctccgccaag 120
gacaagtccc agcacgcggc ggactacgag gcgatcatat cggccgtgaa ggggcaganc 180
gtgaaggcga agcagctcgc ggcgcagctc atcccccgct tcttccggag cttcccggca 240
ctcgccccgc gcgccatgga ggccatgttc gacctcgtcg acatggatga actcgcgact 300
agaatacaac tattcgtggg ttttcacttc ttgccaaana tgcanaattt gtctcaaaaa 360
ttgccganat ccttggacaa tccttgcaan tnaggaaaat gtggacgtga tgctgtcata 420
aagcacngat gtcncttata cggcaggatt taaaattctt gcancttatt angattggat 480
tcgggatata attctnaaaa ttattgttcc taagaaangc tccngtaaag aaantgtgaa 540
ctcaacagag ngaaat                                                 556

<210> 10
<211> 131
<212> PRT
<213> Oryza sativa

<220>
<221> UNSURE
<222> (45)
<223> Xaa can be any naturally occurring amino acid

<220>
```

```
<221> UNSURE
<222> (98)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> UNSURE
<222> (100)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> UNSURE
<222> (108)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> UNSURE
<222> (115)..(116)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> UNSURE
<222> (128)
<223> Xaa can be any naturally occurring amino acid

<220>
<221> UNSURE
<222> (130)
<223> Xaa can be any naturally occurring amino acid

<400> 10
Met Ala Ala Ser Asp Ala Asp Ala Ala Glu Val Glu Arg Leu Tyr Glu
1               5                   10                  15

Leu Gly Glu Arg Leu Ser Ser Ala Lys Asp Lys Ser Gln His Ala Ala
            20                  25                  30

Asp Tyr Glu Ala Ile Ile Ser Ala Val Lys Gly Gln Xaa Val Lys Ala
        35                  40                  45

Lys Gln Leu Ala Ala Gln Leu Ile Pro Arg Phe Phe Arg Ser Phe Pro
    50                  55                  60

Ala Leu Ala Pro Arg Ala Met Glu Ala Met Phe Asp Leu Val Asp Met
65                  70                  75                  80

Asp Glu Leu Ala Thr Arg Ile Gln Leu Phe Val Gly Phe His Phe Leu
                85                  90                  95

Pro Xaa Met Xaa Asn Leu Ser Gln Lys Leu Pro Xaa Ser Leu Asp Asn
            100                 105                 110

Pro Cys Xaa Xaa Gly Lys Cys Gly Arg Asp Ala Val Ile Lys His Xaa
        115                 120                 125

Cys Xaa Leu
    130

<210> 11
<211> 749
<212> DNA
```

<213> Glycine max

<220>
<221> unsure
<222> (678)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (724)
<223> n is a, c, g or t

<220>
<221> unsure
<222> (745)
<223> n is a, c, g or t

<400> 11

```
gcgctggcta ctgtttatag tttactgtaa actgtgttta cgttgtgtcg tgtggcgtgt  60
tcagtgaggt aagggaaact cgtccccatc gaagagctta cttgacctcg caccacggaa 120
tcgttcccta ctaattcaac tcaacaacac tatcgtctcc attcactagt tagaaacgtg 180
cgttccaatg tctgatcctg ccgaagaggc tgctttcatc gagaagctct acgaatacgg 240
cgagcaactc aacaacacta tcgtctccat tcactagtta gaaacgtgcg ttccaatgtc 300
tgatcctgcc gaagaggctg ctttcatcga gaagctctac gaatacggcg agcaactcaa 360
caatgccaag gacaagtcgc agaatgtgca ggattaccag ggaatcatag atgcggcgaa 420
gacgagtgtg aaggcgaagc agctcgctgc acagctgatt cccaggttct acaagttctt 480
tcctgacctt tctagccctg ctctcgatgc acatcttgat ttggttgagg ctgaagaact 540
cggggttcga gtgcaagcaa ttagaggtct gcctcttttt tgtaaggata cacctgagaa 600
tattgggaag atggttgata ttcttgtgca aattcttggg tctgaggaat ttgtggagcg 660
tgatgcagta cataaggntc ttaagtcctt tgctgaggca aggatgtcaa aagcttcctt 720
gacngctttg ttaagcacaa ttggnaagg                                   749
```

<210> 12
<211> 131
<212> PRT
<213> Glycine max

<220>
<221> UNSURE
<222> (128)
<223> Xaa can be any naturally occurring amino acid

<400> 12

```
Met Ser Asp Pro Ala Glu Glu Ala Ala Phe Ile Glu Lys Leu Tyr Glu
1               5                   10                  15

Tyr Gly Glu Gln Leu Asn Asn Ala Lys Asp Lys Ser Gln Asn Val Gln
            20                  25                  30

Asp Tyr Gln Gly Ile Ile Asp Ala Ala Lys Thr Ser Val Lys Ala Lys
        35                  40                  45

Gln Leu Ala Ala Gln Leu Ile Pro Arg Phe Tyr Lys Phe Phe Pro Asp
    50                  55                  60

Leu Ser Ser Pro Ala Leu Asp Ala His Leu Asp Leu Val Glu Ala Glu
65                  70                  75                  80

Glu Leu Gly Val Arg Val Gln Ala Ile Arg Gly Leu Pro Leu Phe Cys
                85                  90                  95
```

Lys Asp Thr Pro Glu Asn Ile Gly Lys Met Val Asp Ile Leu Val Gln
100 105 110

Ile Leu Gly Ser Glu Glu Phe Val Glu Arg Asp Ala Val His Lys Xaa
115 120 125

Leu Lys Ser
130

<210> 13
<211> 115
<212> PRT
<213> Arabidopsis thaliana

<400> 13
Met Val Lys Ser Thr Ser Lys Asp Ala Gln Asp Leu Phe His Ser Leu
1 5 10 15

His Ser Ala Tyr Thr Ala Thr Pro Thr Asn Leu Lys Ile Ile Asp Leu
20 25 30

Tyr Val Cys Phe Ala Val Phe Thr Ala Leu Ile Gln Val Ala Tyr Met
35 40 45

Ala Leu Val Gly Ser Phe Pro Phe Asn Ser Phe Leu Ser Gly Val Leu
50 55 60

Ser Cys Ile Gly Thr Ala Val Leu Ala Val Cys Leu Arg Ile Gln Val
65 70 75 80

Asn Lys Glu Asn Lys Glu Phe Lys Asp Leu Ala Pro Glu Arg Ala Phe
85 90 95

Ala Asp Phe Val Leu Cys Asn Leu Val Leu His Leu Val Ile Ile Asn
100 105 110

Phe Leu Gly
115

<210> 14
<211> 114
<212> PRT
<213> Oryza sativa

<400> 14
Met Pro Arg Ala Thr Ser Asp Ala Lys Leu Leu Ile Gln Ser Leu Gly
1 5 10 15

Lys Ala Tyr Ala Ala Thr Pro Thr Asn Leu Lys Ile Ile Asp Leu Tyr
20 25 30

Val Val Phe Ala Val Ala Thr Ala Leu Ile Gln Val Val Tyr Met Gly
35 40 45

Ile Val Gly Ser Phe Pro Phe Asn Ser Phe Leu Ser Gly Val Leu Ser
50 55 60

Cys Ile Gly Thr Ala Val Leu Ala Val Cys Leu Arg Ile Gln Val Asn
65 70 75 80

Lys Asp Asn Lys Glu Phe Lys Asp Leu Pro Pro Glu Arg Ala Phe Ala
85 90 95

Asp Phe Val Leu Cys Asn Leu Val Leu His Leu Val Ile Met Asn Phe
100 105 110

Leu Gly

<210> 15
<211> 117
<212> PRT
<213> Pisum sativum

<400> 15
Met Ala Lys Thr Ser Ser Thr Thr Lys Asp Ala Gln Asp Leu Phe His
1 5 10 15

Ala Ile Trp Ser Ala Tyr Ser Ala Thr Pro Thr Asn Leu Lys Ile Ile
20 25 30

Asp Leu Tyr Val Val Phe Ala Val Phe Thr Ala Leu Leu Gln Asp Val
35 40 45

Tyr Met Ala Leu Val Gly Pro Phe Pro Phe Asn Ser Phe Leu Ser Gly
50 55 60

Val Leu Ser Cys Val Gly Thr Ala Val Leu Ala Val Cys Leu Arg Ile
65 70 75 80

Gln Val Asn Lys Glu Asn Lys Glu Phe Lys Asp Leu Gly Pro Glu Arg
85 90 95

Ala Phe Ala Asp Phe Val Leu Cys Asn Leu Val Leu His Leu Val Ile
100 105 110

Met Asn Phe Leu Gly
115

<210> 16
<211> 528
<212> PRT
<213> Homo sapiens

<400> 16
Met Gly Leu Ser Leu Thr Met Pro Thr Val Glu Glu Leu Tyr Arg Asn
1 5 10 15

Tyr Gly Ile Leu Ala Asp Ala Thr Glu Gln Val Gly Gln His Lys Asp
20 25 30

Ala Tyr Gln Val Ile Leu Asp Gly Val Lys Gly Gly Thr Lys Glu Lys
35 40 45

Arg Leu Ala Ala Gln Phe Ile Pro Lys Phe Phe Lys His Phe Pro Glu
50 55 60

Leu Ala Asp Ser Ala Ile Asn Ala Gln Leu Asp Leu Cys Glu Asp Glu
65 70 75 80

```
Asp Val Ser Ile Arg Arg Gln Ala Ile Lys Glu Leu Pro Gln Phe Ala
                85                  90                  95

Thr Gly Glu Asn Leu Pro Arg Val Ala Asp Ile Leu Thr Gln Leu Leu
            100                 105                 110

Gln Thr Asp Asp Ser Ala Glu Phe Asn Leu Val Asn Asn Ala Leu Leu
        115                 120                 125

Ser Ile Phe Lys Met Asp Ala Lys Gly Thr Leu Gly Gly Leu Phe Ser
    130                 135                 140

Gln Ile Leu Gln Gly Glu Asp Ile Val Arg Glu Arg Ala Ile Lys Phe
145                 150                 155                 160

Leu Ser Thr Lys Leu Lys Thr Leu Pro Asp Glu Val Leu Thr Lys Glu
                165                 170                 175

Val Glu Glu Leu Ile Leu Thr Glu Ser Lys Lys Val Leu Glu Asp Val
            180                 185                 190

Thr Gly Glu Glu Phe Val Leu Phe Met Lys Ile Leu Ser Gly Leu Lys
        195                 200                 205

Ser Leu Gln Thr Val Ser Gly Arg Gln Gln Leu Val Glu Leu Val Ala
    210                 215                 220

Glu Gln Ala Asp Leu Glu Gln Thr Phe Asn Pro Ser Asp Pro Asp Cys
225                 230                 235                 240

Val Asp Arg Leu Leu Gln Cys Thr Arg Gln Ala Val Pro Leu Phe Ser
                245                 250                 255

Lys Asn Val His Ser Thr Arg Phe Val Thr Tyr Phe Cys Glu Gln Val
            260                 265                 270

Leu Pro Asn Leu Gly Thr Leu Thr Thr Pro Val Glu Gly Leu Asp Ile
        275                 280                 285

Gln Leu Glu Val Leu Lys Leu Leu Ala Glu Met Ser Ser Phe Cys Gly
    290                 295                 300

Asp Met Glu Lys Leu Glu Thr Asn Leu Arg Lys Leu Phe Asp Lys Leu
305                 310                 315                 320

Leu Glu Tyr Met Pro Leu Pro Pro Glu Glu Ala Glu Asn Gly Glu Asn
                325                 330                 335

Ala Gly Asn Glu Glu Pro Lys Leu Gln Phe Ser Tyr Val Glu Cys Leu
            340                 345                 350

Leu Tyr Ser Phe His Gln Leu Gly Arg Lys Leu Pro Asp Phe Leu Thr
        355                 360                 365

Ala Lys Leu Asn Ala Glu Lys Leu His Glu Ser Lys Ile Arg Leu Gln
    370                 375                 380

Tyr Phe Ala Arg Gly Leu Gln Val Tyr Ile Arg Gln Leu Arg Leu Ala
385                 390                 395                 400
```

```
Leu Gln Gly Lys Thr Gly Glu Ala Leu Lys Thr Glu Glu Asn Lys Ile
                405                 410                 415

Lys Val Val Ala Leu Lys Ile Thr Asn Asn Ile Asn Val Leu Ile Lys
            420                 425                 430

Asp Leu Phe His Ile Pro Pro Ser Tyr Lys Ser Thr Val Thr Leu Ser
        435                 440                 445

Trp Lys Pro Val Gln Lys Val Glu Ile Gly Gln Lys Arg Ala Ser Glu
    450                 455                 460

Asp Thr Thr Ser Gly Ser Pro Pro Lys Lys Ser Ser Ala Gly Pro Lys
465                 470                 475                 480

Arg Met Pro Gly Arg Phe Ile Thr Leu Pro Val Gly Asn Ile Ala Ala
                485                 490                 495

Ile Trp Ala Thr Leu Ile Met Arg Gly Ala Phe Arg Gly Ser Lys Trp
            500                 505                 510

Pro Arg Leu Gly His Thr Lys Glu Ile Val Val Gly Glu Arg Leu Tyr
        515                 520                 525
```